Notice of Allowability	Application No.	Applicant(s)	
	10/603,544	MAY, MARCUS W.	
	Examiner	Art Unit	
	Jean B Jeanglaude	2819	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *06-25-03*.

2. ☒ The allowed claim(s) is/are *1-18*.

3. ☒ The drawings filed on *25 June 2003* are accepted by the Examiner.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

Jean Bruner Jeanglaude
JEAN JEANGLAUDE
PRIMARY EXAMINER

Reasons For Allowance

Claims 1 – 18 are allowable.

1. The following is an examiner's statement of reasons for allowance: in combination with other limitations of the claims the prior arts made of record fail to suggest a digital to analog converter that comprises a conversion control operably couples a first set of a plurality of current sources to an inverting input or non-inverting input of a differential amplifier in accordance with a first set of bits of a digital input and couples, via at least one inversion, a second set of a plurality of current sources to an inverting or non-inverting input of differential amplifier based on a second set of bits of the digital input. Moreover, in combination with other limitations of the claims, the prior arts made fail to suggest a digital to analog converter that comprises a plurality of switching modules wherein each of the plurality of switching modules is operably coupled to a corresponding current source of a plurality of current sources, wherein a first set of the plurality of switching modules couples the corresponding current sources to a differential amplifier module in a first manner based on a digital input value and a second set of the plurality of switching modules couples the corresponding current sources to the differential amplifier module in a second manner based on the digital input such that, over time, errors introduced by the coupling in the first manner substantially compensate for errors introduced by the coupling in the second manner. Also, in combination with other limitations of the claims the prior arts made of record fail to suggest an apparatus for digital to analog conversion that generates a first signal based on each bit of a first set of a plurality of bits is in a first state and based on an

inversion of each bit of a second set of the plurality of bits that is in the first state; generates a second digital signal based on each bit of the first set of the plurality of bits that is in a second state and based on an inversion of each bit of the second set of the plurality bits that is in the second state.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

2. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

3. Wilensky et al. (US Patent Number 3,857,021) discloses a multiplying current mode DAC.

4. Tokuhiro (US Patent Number 5,028,926) discloses a successive ADC with a variable reference voltage for the DAC.

5. Sako et al. (US Patent Number 5,148,161) discloses a digital signal processor for fixed and floating point data.

6. Huang et al. (US patent Number 5,870,049) discloses a current mode DAC.

7. Okuda et al. (US Patent Number 5,995,031) discloses a DAC an ADC.

8. Bult et al. (US Patent Number 6,414,618) discloses a DAC with reduced ringing.

9. Leung et al. (US patent Number 6,448,917) discloses a DAC using current source driving main resistor string.

10. Isobe et al. (US patent Number 6,549,154) discloses a DAC and synchronous circuit using the converter.

11. Moser (US patent Number 6,549,156) discloses a method of forming a semiconductor device and structure therefor.

12. Clara et al. (US patent Number 6,593,868) discloses a differential DAC.

13. Khoini-Poorfard et al. (US Patent Number 6,639,534) discloses a DAC switching circuitry.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jean B Jeanglaude whose telephone number is 571-272-1804. The examiner can normally be reached on Monday - Friday 7:30 A. M. - 5:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Tokar can be reached on 571-272-1812. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jean Bruner Jeanglaude

Jean Bruner Jeanglaude
March 15, 2004